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ABSTRACT

Substance use histories were obtained from 103 persons (16 to 63 years of age) with recent spinal cord injuries (SCI). Lifetime exposure to and current use of substances with abuse potential were substantially greater in this sample compared to a like-age national sample. Exposure to and recent use of substances with abuse potential was considerably greater for persons who reported being intoxicated at injury. These results suggest that a significant number of persons with recent SCI have extensive drug use histories and may be at risk for poor rehabilitation outcome. Timely assessment and intervention of substance abuse problems could help enhance psychosocial and vocational outcomes. (Author/DB)

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# Substance Use by Persons with Recent Spinal Cord Injuries

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# Substance Use by Persons with Recent Spinal Cord Injuries

## Abstract

Substance use histories were obtained from 103 persons with recent spinal cord injuries (SCI). Lifetime exposure to and current use of substances with abuse potential were substantially greater in this sample compared to a like-age national sample. Exposure to and recent use of substances with abuse potential was considerably greater for persons who reported being intoxicated at injury. These results suggest that a significant number of persons with recent SCI have extensive drug use histories and may be at risk for poor rehabilitation outcome. Timely assessment and intervention of substance abuse problems could help enhance psychosocial and vocational outcomes.

## Substance Use by Persons with Recent Spinal Cord Injuries

Drug and alcohol use is a cause of injury and death for thousands of Americans every year (Trieschmann, 1979). Spinal cord injury (SCI) is one type of injury often associated with drug and alcohol consumption (Sweeney & Foote, 1982). The U.S. population of persons with SCI was approximately 150,000 in 1978, with 7,000 to 10,000 new SCI cases occurring each year (National Spinal Cord Injury Model Systems Conference, 1978; NSCIMSC). The SCI population is predominantly young and male. Approximately 60% of SCI occur in persons between 16 and 30 years (NSCIMSC, 1978; National Spinal Cord Injury Statistical Center, 1985; NSCISC), and about 82% of all reported SCI occur among males (NSCISC, 1985). The mean initial hospital care costs following SCI reported in 1985 were $50,863 (NSCISC, 1985). Persons with SCI confront physical, psychological and vocational difficulties which can include 1) sensory impairment, 2) pain, 3) feelings of uselessness and helplessness, 4) depression, 5) alterations in sexual functioning and 6) reduced employment opportunities (Hohmann, 1975; Trieschmann, 1979). As a result of these problems, persons with SCI may be at a greater risk for drug and alcohol abuse. Alcohol and other drug use by persons with SCI is a concern, not only because it may be the cause of the disability, but because it may adversely affect the rehabilitation process and rehabilitation outcome.

Drug and alcohol use is widespread and well documented among young adults (between 18 and 25 years). While reports of substance use vary depending on the specific population, geographical area, sampling strategies, character of inquiry, reporting sources, and other factors (Grabowski & Dworkin, 1985), investigators are reaching similar conclusions. For example, the 1982 Household Survey on Drug Abuse (Miller & Cisin, 1983) revealed that 11% of Americans of all ages and 27% of young adults were current users of marijuana

or hashish; and the prevalence of current use of alcohol and marijuana is significantly greater among men than women. A summary of the prevalence of alcohol and other drug use in the general population is presented in Figure 1 (Miller & Cisin, 1983). The prevalence of alcohol, cigarettes and marijuana is greatest across all age groups, with significantly higher use of marijuana, alcohol, and cocaine in young adults compared to youths and older adults. The direct costs (treatment and support) and indirect costs (e.g., productivity loss, property damage) for alcohol and other drug abuse were estimated to be $116.7 and $46.9 billion in 1983, respectively (Harwood, Napolitano & Kristiansen, 1984).

Only a limited number of studies have examined drug and alcohol use by persons with SCI. The Wisconsin Department of Health and Social Services (Johnson, 1985) found that the proportion of 579 vocational rehabilitation and independent living center clients with SCI reporting moderate or heavy drinking was twice the rate of that reported in the general population. In a sample of predominantly older veterans with SCI (50 years of age or older), Kirubakaran, Kumar, Powell, Tyler and Armatas (1986) reported that the prevalence of alcohol and drug use was less than the rate reported in a national sample by Fishburne, Abelson and Cisin (1980); this finding provides support that alcohol and other drug abuse is a problem which is more prevalent among younger persons.

A number of studies have found a relationship between the onset of SCI and substance use. Heinemann, Keen, Schnoll and Adair (1986) found that individuals with SCI who were intoxicated at the time of their injury frequently presented histories of alcohol and drug abuse. Fullerton, Harvey, Klein and Howell (1981) reported that 15 of 30 consecutively admitted patients with SCI acknowledged drinking just prior to their accidents, and four had a

diagnosis of alcoholism prior to injury. In a study involving 451 consecutively admitted patients with head injuries, alcohol was suspected or documented in 49% of all cases and in 66% of motor vehicle accident cases (Gale, Dikmen, Wyler, Temkin & McClean, 1983). Trieschmann (1979) and Galbraith, Murray, Patel & Knitt-Jones (1976) report similar findings.

The relationship between SCI etiology, age at injury, and substance use is interesting because it illustrates the risk young adults face for injury and substance use. The four leading causes of SCI are motor vehicle accidents (48%), falls (21%), penetrating wounds (15%) and sport injuries (14%; NSCISC, 1985). Young people are more likely to be injured as a result of motor vehicle accidents, penetrating wounds, and sports injuries, while older persons are more likely to be injured as a result of falling; Trieschmann's (1979) earlier reviews were also consistent with these findings. Frisbie and Tun (1984) examined the relationship between alcohol consumption and SCI etiology in 137 SCI Vietnam Era veterans. Drinking on the day of SCI was reported by 28% of the patients. Persons who reported drinking on the day of injury were more likely to be injured as a result of motor vehicle accidents, falling, gunshot wounds, and diving; no relationship was found between alcohol consumption and injuries due to falling objects or medical illness.

In summary, the relationship between etiology, age, and substance use have been reported, yet no studies have systematically investigated these relationships. More information is needed about the prevalence of alcohol and other drug use prior to SCI and associated problems in order to establish the need for drug and alcohol treatment for persons with SCI and to enhance the effectiveness of injury prevention efforts.

The present study assessed the lifetime use of substances in 20 categories, as well as the quantity and frequency of substance use in the same

20 categories during the six months prior to SCI.

## Methods

### Participants

A total of 168 consecutively admitted patients at a regional rehabilitation hospital met inclusion criteria of being between 13 and 65 years of age, cognitively intact, injured within the past 12 months, and English speaking. Of the 154 patients for whom physician permission to participate was obtained (90% of the eligible patients), 103 (67% of the patients approached) agreed to participate. The participant and nonparticipant groups did not differ from each other in terms of age, gender, race, injury etiology, marital status, or diagnosis.

The sample ranged in age from 16 to 63 years ($\bar{x}$=27.7 years, SD=10.2). Men composed 79% of the sample. The majority of the sample was white (70%); the most frequent injury cause was road and traffic accidents (40%); quadriplegia was the resulting disability for 65% of the sample.

### Procedures

Substance use histories were obtained by asking participants to report if they had ever used a drug in each of 20 categories, and if they had used any of these drugs three or more times during the six months prior to SCI. The drug categories are listed in Figure 1. In addition, participants were asked: "Were you under the influence of alcohol or any other drugs at the time of your injury?" The answer to this question served as the self-report of intoxication.

The validity of participants' report of substance use was vital to this investigation. We took several steps to obtain valid data. Maisto, Sobell, Cooper and Sobell (1979) found that reliability of self-reported alcohol use is improved when data are obtained in a clinical setting, informants are sober, and trained interviewers use a structured, time-line procedure. These

procedures were used in this study. Interviews typically lasted between 2 and 4 hours. Participants were paid $20 at the completion of the interview.

Substance use information from this sample was compared with prevalence data from the National Survey on Drug Abuse (Miller & Cisin, 1983). Substance exposure was defined similarly in both studies; however, recent use was defined by Miller and Cisin as use on one or more occasions in the past month while we defined it as use on three or more occasions during the past six months.

## Results

Figure 1 shows the percentage of the SCI sample reporting use in each of the 20 substance categories as well as drug use data for 18 to 25 year olds from the National Institute on Drug Abuse's 1982 National Survey on Drug Abuse. Substances with at least 40% prevalence included: alcohol (96%), caffeine (93%), tobacco (77%), marijuana (71%), over-the-counter cough syrups (49%), amphetamines (43%) and cocaine (42%). The proportion of the local sample ever using amphetamines, cocaine, and codeine is substantially greater than the proportion of the national sample, while proportions were roughly equivalent for alcohol, tobacco, marijuana, psychedelics and sedatives.

Figure 2 shows the percentage of the SCI sample that used each drug at least three times during the six months prior to SCI as well as NIDA data for 18 to 25 year olds during the month prior to interview. Substances with at least 20% recent use included: alcohol (85%), caffeine (76%), tobacco (52%), marijuana (42%), and cocaine (20%). Recent use by the SCI sample was substantially greater than the national sample for the eight substances for which data are available.

Sex, age, and intoxication at injury differences in prevalence and recent use of the 20 substance categories were examined. Women reported greater

exposure to antidepressants (chi-square (N=103 df=1) = 7.40, p<.01) and anticholinergics (chi-square (N=103 df=1) = 4.19, p<.05), while men reported greater exposure to marijuana (chi-square (N=103 df=1) = 4.69, p<.05).

For this purposes of this analysis, age was categorized in three groups; less than 20 years, 20 through 29 years, and 30 years and older. Exposure to and current use of marijuana was greatest for the 20 to 29 year olds (chi-square (N=103 df=2) = 6.28, p<.05; chi-square (N=103 df=2) = 6.41, p<.05, respectively). Cocaine exposure also was greatest for the 20 to 29 year olds (chi-square (N=103 df=2) = 20.91, p<.001), while over-the-counter cough syrup exposure was greatest for participants 30 years and older (chi-square (N=103 df=2) = 16.11, p<.01). Finally, participants less than 20 years reported the greatest recent use of psychedelics (chi-square (N=103 df=2) = 8.89, p<.01).

Self-report of intoxication at time of injury was reported by 39% of the sample. Persons who reported intoxication also were more likely to report exposure to marijuana (chi-square (N=103 df=2) = 6.28, p<.05); tobacco (chi-square (N=103 df=2) = 8.67, p<.01), sedative/hypnotics (chi-square (N=103 df=2) = 15.69, p<.001), barbiturates (chi-square (N=103 df=2) = 14.75, p<.01), amphetamines (chi-square (N=103 df=2) = 12.55, p<.01), psychedelics (chi-square (N=103 df=1) = 14.07, p<.001), and phencyclidine (chi-square (N=103 df=1) = 7.29, p<.01). In addition, persons who reported intoxication at SCI onset also were more likely to report recent use of amphetamines (chi-square (N=103 df=1) = 8.87, p<.01), marijuana (chi-square (N=103 df=1) = 3.77, p<.05), alcohol (chi-square (N=103 df=1) = 6.08, p<.01), and cocaine (chi-square (N=103 df=1) = 6.00, p<.01).

## Discussion

This sample of persons with recent SCI reported greater lifetime exposure to and current use of substances compared to a like-age (18 to 25 year olds)

national sample (Miller & Cisin, 1983). Of particular concern is exposure to substances with abuse potential. Persons with SCI reported considerably greater lifetime exposure to amphetamines, codeine, cocaine, and psychedelics, and comparable exposure to tobacco, marijuana, alcohol and sedatives. Reports of recent substance use three or more times during the six months prior to SCI were substantially greater in the SCI sample than in the national sample for all eight of the available drug categories. In addition, exposure to and recent use of substances with abuse potential was considerably greater for persons who reported being intoxicated at time of injury.

Consistent with previous investigations on substance use (Miller & Cisin, 1983), young adults (20 to 29 year olds) reported significantly greater exposure to and current use of marijuana, and significantly greater cocaine exposure. In addition, men reported greater exposure to marijuana, while greater exposure to antidepressants and anticholinergics were reported by women.

These findings have several implications. First, substantially greater lifetime and current substance use may place persons with SCI at greater risk for substance abuse. Many studies have reported a relationship between previous substance use and subsequent use of other drugs (cf., Dembo, Blount, Schmeidler & Burgos, 1985). Second, greater exposure to or current use of substances may result in a greater likelihood of incurring traumatic injuries. Intoxication results in impaired judgment and increases the likelihood of taking risks which may result in physical injury. Third, clinical implications are suggested. Assessing alcohol and drug-abuse related problems, training staff to identify behavioral indicators of past and present substance abuse, and establishing referral networks to substance abuse treatment programs are important if a potential dual disability is to be identified and treated in a

timely fashion.

Although the present study is not without limitations, it is the most comprehensive and systematic investigation of substance use in persons with SCI to date. Previous studies have been limited to investigations of substance use by veterans with SCI (Frisbie & Tunn, 1984; Kirubakaran et al, 1986; Sweeney & Foote, 1982), thereby raising concerns about the representativeness of these samples and generalization to the nonveteran population. While the present study recruited participants from one region, a civilian sample was employed, and the rehabilitation hospital from which subjects were recruited is distinguished by a large and varied catchment area, thus increasing the likelihood of obtaining a representative sample.

Although some researchers question the reliability and validity of self-reported substance use, the collection of accurate and reliable information was enhanced by using Maisto, Sobell, Cooper, and Sobell's (1979) procedures. In addition, participants were informed that the information provided was strictly confidential and protected from subpoena; all participants were cognitively intact and English speaking, thus enhancing the likelihood that participants clearly comprehended the information being requested of them; and the time span between the time of injury and initial interview was less than 12 months in all cases, and less than 3 months in most cases.

Selecting an appropriate comparison group for this sample of persons with SCI is difficult given the lack of available normative data. A young adult national comparison group was selected because it is most similar in terms of age and probable substance use experience. While the mean age of our sample was 28 years, the age range was 16 to 63 years. Therefore, this difference in age distribution is unlikely to exaggerate differences between the two groups because young adults consistently report a higher level of substance use

(Dembo et al, 1985). In addition, our definition of current use is more stringent than those used in national studies (Miller & Cisin, 1983). Our definition of recent use required that participants use each substance three or more times in the last six months. Finally, the present study approached substance use in a more comprehensive manner by employing discrete drug categories, rather than combining drug categories as was done in other studies (Kirubakaran et al, 1986; Miller & Cisin, 1983; Sweeney & Foote, 1982). Consequently, the discrepancies reported between other surveys and this SCI sample are likely to be underestimated rather than inflated.

Future research could assess the extent to which these patterns of substance use continue post-hospitalization. An exploration of the rehabilitation outcomes associated with different patterns of pre- and post-disability substance use is important given the high prevalence and recent use reported by this sample. We do not know if persons who abuse substances prior to injury are more or less likely to abuse substances after injury, or are less likely to achieve favorable outcomes. This is an important step in learning the meaning of substance use in the lives of a large group of persons with disabilities.

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Figure 1

Lifetime Drug Exposure in Two Samples

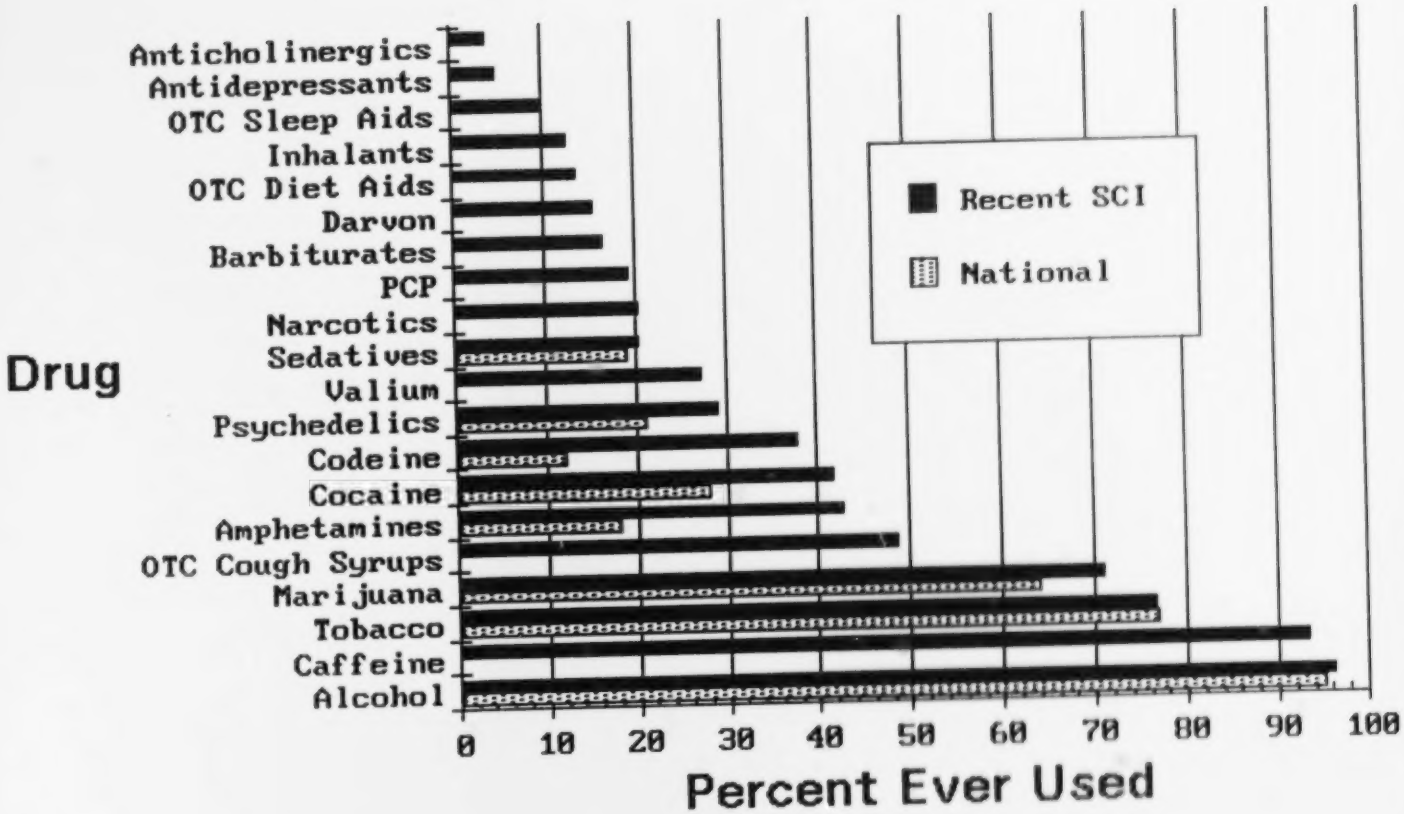

Figure 2

Recent Drug Use in Two Samples